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October/November 2011

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A family affair

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Root knot nematode in
potato crops

Sowing the seed of success

The art of seed selection

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The tour to Belgium and the United Kingdom will incorporate Scotland for the World Potato Congress.

The project has been funded by HAL using the fresh and processed potato levies, voluntary contributions from industry and matched funds from the Australian Government.

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**FRONT COVER:**

Darren and Frank Mitolo

Photo supplied by Andrew Beveridge

John Brent AUSVEG Chairman

I would like to congratulate Mr Geoff Moar on his appointment as the new Deputy Chair of AUSVEG. He succeeds Dr Elizabeth Duncan, who has decided to step down from the role to allow a grower to serve as the Deputy Chair. Dr Duncan said it was important for the long-term interests of AUSVEG to create an opportunity for a grower to hold the position.

For the past 40 years, Mr Moar has grown fresh and processed potatoes in the Riverina area of New South Wales for the crisping and fresh markets. An existing AUSVEG Director, Mr Moar will bring his personal experiences as a prominent producer within the industry to the role.

I would like to thank Dr Duncan for her outstanding efforts and support as the Deputy Chair of AUSVEG. Dr Duncan will continue to serve

as Chair of the AUSVEG Audit & Finance Committee and as a Director of AUSVEG.

Representing the Australian vegetable and potato industries, AUSVEG will attend Asia's acclaimed agribusiness showcase, AgriPro Asia (APA). From 30 November to 2 December, this industry event will promote international trading activities of agricultural products. AUSVEG will be exhibiting alongside the many other international organisations that are expected to attend.

There is a lot of potential to get Australian vegetable suppliers into the Chinese market, with a population estimated to now exceed 1.33 billion people. It's possible that in the future, Australian produce could well hold a prominent place alongside international producers. However, it is important that we recognise

that the high value of the Australian dollar at this time is an impediment to export activity.

Looking to the future, food sustainability has become a prominent topic, with the global population expected to surpass nine billion by 2050. AUSVEG has been heavily involved in the consultation process as part of the National Food Plan, which aims to ensure the sustainability of the Australian food industry. As an advanced agricultural nation providing land that is amenable to vegetable production, Australia must continue to improve its efficiency through innovation, and investment in research and development into growing and producing food.

With a high demand for produce globally, Australia has the expertise and technology required to provide not only for its needs domestically, but also

for those of a growing global population. Although importantly, it is essential that Australia remains self-sufficient and does not become reliant on imported foods.




John Brent
Chairman
AUSVEG

Richard Mulcahy AUSVEG Chief Executive Officer

Leading potato growers and processors met in Hobart recently for the Fresh and Processed Potato Industry Advisory Committee (IAC) meetings and discussed important and innovative industry R&D opportunities. International guests also attended the meetings, with Potatoes New Zealand Business Manager, Ron Gall, and Deputy Chairman, Murray Turley, presenting information on behalf of the New Zealand sector of the potato industry.

Further progress has been made with the Potato Cyst Nematode (PCN) National Management Plan, with key members of the industry reviewing its development. The document is being examined by a number of parties to ensure the extent and

quality of the finalised plan is appropriate. Revision of the plan to accommodate input from growers, state regulatory representatives and key industry figures was prompted after extensive national consultations occurred earlier this year.

Dr Doris Blaesing, who has been involved with the potato industry for many years and was involved with the consultations, is currently writing the revised PCN National Management Plan, which will be significantly simplified. Once the document is finalised and approved by the Potato Industry Advisory Committee, it then needs to be put before the State and Federal regulators.

AUSVEG has Australian potato growers' best interests in mind and will ensure that the finalised document is a workable plan to

combat this destructive pest.

In Melbourne, the AUSVEG Board also met recently to consider how it would deal with a range of issues currently affecting the sector. Appropriate food safety programs and chemical certification underpin good operational practices and it was considered fundamentally important that there was a uniform approach established across the industry in this regard. Initiatives such as the ChemCert program have been created to address community concerns in regards to the on-farm use of chemicals and the need to protect the health and safety of workers through contemporary training, which ensures only progressive procedures are adopted.

AUSVEG encourages all potato growers to undertake these

training courses and actively engage in quality assurance certification, if they are not already.




Richard J Mulcahy
Chief Executive Officer
AUSVEG



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Editorial

This edition of *Potatoes Australia* finds us edging closer to the end of the year, with 2012 nearly in our grasp.

Most states around Australia have now begun or are in the midst of a new growing season. To coincide with this time, for this issue we have spoken with growers in every state to see how the season is tracking so far (pg 23).

A prominent player in the industry for over 40 years, we interviewed the Managing Director of South Australian packing/growing giant, The Mitolo Group. Darren Mitolo offers a rare glimpse inside the family-owned and run business—telling of the rise to the top, the discovery of the world's first low GI potato and the challenges the family has faced along the way (pg 20).

With the 2012 AUSVEG



AUSVEG National Convention Hobart - Pg 17



Snapshot of the season - Pg 23

National Convention, Trade Show and Awards for Excellence in our sights, this issue gives readers a sneak peak at the excitement and events AUSVEG has organised for Convention delegates.

Innovation and progressions in Research and Development (R&D) in the industry allow for the better advancement of pioneering, efficient and sustainable growing practices.

In this edition, we feature articles with a focus on some

of the issues too small for the eye to discover, with diagnostic testing of soils to detect soil-borne pathogens (pg 13) and the identification and management of species of Root knot nematode (pg 11). To aid potato growers in the continuing conundrum of picking the right seed for successful crop production, we have featured a step-by-step guide on the art of selecting the right seed (pg 15).

Making news headlines

world-wide, the discovery of the potato genome sequence has aided scientists and potato variety breeders with the genetic information to create improved cultivars. We spoke with the leading scientists and researchers that made this breakthrough possible for the International R&D Update (pg 30).

This October/November issue of the magazine also features the latest soil solutions, ask the industry, pests & diseases and the young grower profile.

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Darren Mitolo

The Mitolo Group - Pg 20

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NEWS IN BRIEF

Food Security – a priority for the Australian industry

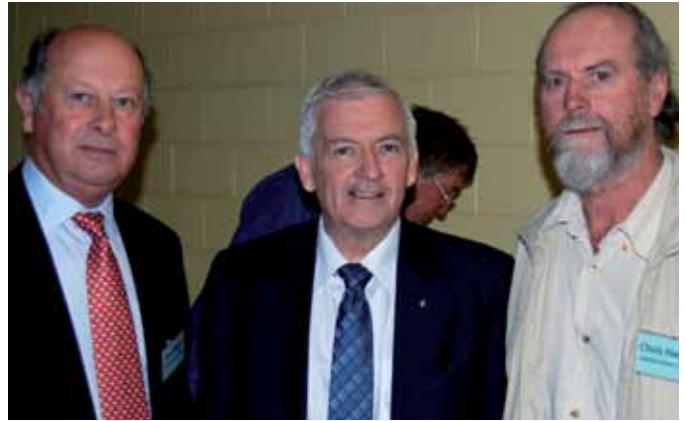
The Sydney Showgrounds hosted the 2011 New South Wales Farmers' Association (NSWFA) Horticulture Conference recently, where some 70 delegates attended.

AUSVEG CEO, Richard Mulcahy, spoke at the NSWFA Horticulture Conference recently, addressing key industry members on current issues affecting the industry.

Mr Mulcahy detailed the importance of food security,

current and emerging issues for the industry, food production capabilities and also discussed policies for the NSWFA's horticulture sector.

Independent Senator for South Australia, Nick Xenophon, also delivered an impassioned



Geoff Moar (NSWFA Horticulture Committee and AUSVEG Director), AUSVEG CEO Richard Mulcahy and Chris Nelson (Horticulture Committee)

speech to delegates on the issues of biosecurity, country of origin labelling and food security.

Industry organisations and government departments represented at the Conference included APAL, AUSVEG,

Freshcare, Horticulture Mediation Advisor, Sydney Markets Ltd, Food Standards Australia & New Zealand (FSANZ), Department of Primary Industries NSW, University of Western Sydney and the NSW Food Authority.

Research reveals potatoes reduce blood pressure

Scientists in the United States have found that a couple of servings of spuds a day can reduce blood pressure almost as much as oatmeal, without causing weight gain.



Researchers conducted the study on 18 patients, who were primarily overweight, with high blood pressure. The group was supplied with six to eight purple potatoes with skins, cooked in a microwave oven without oil, twice daily for one month.

The results revealed that the

patients' average diastolic blood pressure decreased by 4.3 per cent and systolic pressure decreased by 3.5 per cent.

Lead researcher Joe Vinson PhD, with the University of Scranton, Pennsylvania, said the potato has an undeserved bad reputation for being 'fattening, high in carbohydrates and

empty calories'.

"In reality, when prepared without frying and served without butter, margarine or sour cream, one potato has only 110 calories and dozens of healthful phytochemicals and vitamins," he said.

Presented at a National Meeting of the American

Chemical Society (ACS), the research is hoped to re-establish the potato's popular nutritional image.

Researchers suspect future studies using white potatoes, now in the planning stages, will produce similar results.

Australian Workers Union and AUSVEG to work on country of origin labelling

Following a recent meeting, the two organisations have agreed to make a joint effort towards an improvement in Australia's country of origin labelling laws.

Leading Australian trade unionist and National Secretary of the Australian Workers Union (AWU), Paul Howes, and AUSVEG Chief Executive Officer, Richard Mulcahy, met recently to discuss the current issue of country of origin labelling in Australian retailers.

Understanding where produce on the supermarket shelves has come from could be called a trying task, with confusing pictures, wording and packaging-leading Australian consumers to face an environment that often clouds their opportunity to

select products from Australian producers.

The joint endeavor between AWU and AUSVEG aims to ensure that consumers have a better understanding of where the produce has originated from and will also contribute to the continuation of the Australian horticulture industry and the preservation of employment in the sector.

The two organisations plan to make representations in support of reforms to Federal Agriculture Minister, Senator Joe Ludwig, and other key decision-makers in the Australian Parliament.



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Mr Glazebrook and the world record-breaking potato



The colossal 4.99kg spud. Photos courtesy of BBC Nottingham

No small fry – world's heaviest potato

A hobby gardener in the United Kingdom has grown a potato so large it has been named the world's heaviest by the Guinness Book of Records.

As reported by the BBC, the colossal spud weighs in at nearly 5kg, smashing the previous year's record of 3.8kg—both titles held by Peter Glazebrook from Nottinghamshire, UK.

With more than a decade's

worth of experience growing world record-winning giant vegetables, including the longest beetroot and heaviest parsnip, Mr Glazebrook said his passion for oversized vegetables stemmed from trying to win at a local garden show.

The gardening enthusiast said his triumphant veggies were the result of a lot of tender love and care.

"I only grew nine plants so I could concentrate on those nine," Mr Glazebrook told the BBC.

"That's the secret, just concentrate on a few and give them a long growing season."

Admired for its record-breaking title, Mr Glazebrook admitted the giant potato may be eaten at a later date.

Vegemite 'chips in' with new flavour

Unable to forget the infamous jingle featured in the ads for the iconic Australian spread, it might seem a bold move to create a new Vegemite snack in the form of a chip.

Arguably, most Aussies love the spread on their morning piece of toast, but some may not have thought to put it on their chips. It seems innovators at processing chip giant Smiths, and creators of the well-known spread from Kraft, have done just that with the release of their new Vegemite chip.

October is set to be the month of release for the limited edition novel snack, combining arguably two of Australia's most iconic brands. The new crinkle cut chip is an inventive move from product developers and will be available on selected supermarket

shelves across the country for approximately 12 weeks.

But can consumers look forward to a new ad campaign with Smith's chip monster, the Gobbledoc, devouring a packet of Vegemite 'chippies'?



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DNA tests identify different species of Root knot nematode

A national project led by the Tasmanian Institute of Agricultural Research is identifying species of Root knot nematode and its prevalence for improved management of the pest in Australian vegetable crops.

Root knot nematode (RKN) is a soil-borne pest which can cause massive reductions in crop yields and quality. Nematodes invade host plant roots causing the formation of knots or galls (hence the name) and can induce the loss of root functions.

The project

The Tasmanian Institute of Agricultural Research (TIAR) is leading a national project to investigate the improved management of RKN in vegetable crops, particularly in tomatoes and potatoes. The research project is funded by

Horticulture Australia Limited (HAL) using the National Potato and Vegetable levies with voluntary contributions from Plant and Food New Zealand and matched funds from the Australian Government.

Contributing state-of-the-art technologies to the project, the South Australian Research and Development Institute (SARDI) has developed a new species-specific DNA test for detecting RKN in soils, plant roots and also potato peels.

The Department of Agriculture and Food Western Australia, the Department of

Employment, Economic Development and Innovation, Biological Crop Protection and Crop Protection Research are also involved in the national project to better equip potato growers against the nematode.

Researchers are conducting pre-planting and post-harvest

surveys of RKN in different regions of Australia by DNA-based testing to identify species of the nematode. The project will also test new chemical options for the control of RKN in an effort to offer a 'soft' treatment alternative to growers.

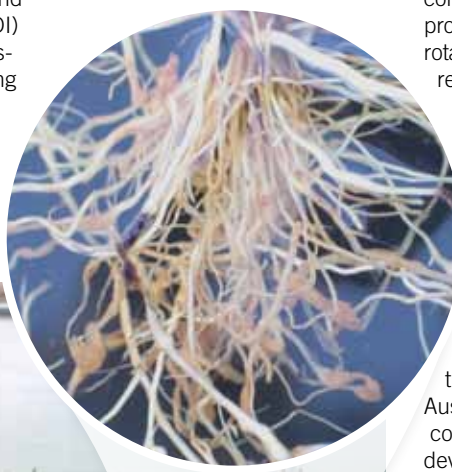
The surveys are only one component of the major research project that will investigate crop rotations or break crop options to reduce nematode infestations in between planting seasons.

Research suggests that agronomically viable break crops used in different regions will assist in the development of farming practices which are suppressive to RKN.

Undertaking different aspects of the research throughout each state of Australia, the Queensland component of the project is developing a farming system that can be used to cultivate a soil which will be aggressive to RKN, with the use of surface mulches and other biological means. This phase of the project intends to develop a system for growing vegetables without any other form of control method for nematodes-ultimately to remove the need for chemical means.

Results so far

Senior researcher at TIAR and project leader, Dr Frank Hay, believes project results will be beneficial for potato growers in establishing a soil test that will not only detect the different species of RKN, but also allow for other soil-borne pathogens to be tested at the same time, from



Researcher Suzie Jones with tomato plants in a TIAR greenhouse and [inset] The characteristic galls (knots) on tomato plant roots

continued over page ►

the same soil sample.

“Nationally surveys have either started or have nearly been completed; they are taking place to figure out which species of Root knot nematode dominate in particular regions,” Dr Hay said.

“Species such as *M. fallax* can cause more severe damage on potatoes, perhaps more than other species. From this point of view it is important for growers to know which species is present so they can utilise the most appropriate treatment.”

“Root knot nematode is a

many RKNs are present, but also obtain a breakdown of the species. This will allow growers to then choose the best crop rotation to eradicate the nematode problem or provide information to assist in the decision-making process of selecting a less susceptible crop to grow.

Dr Hay said: “If a grower knows what species is present or what is most prevalent in their region, they might be able to pick a suitable break crop that doesn’t host the nematode and allow the pest to die off between

“Nationally surveys have either started or have nearly been completed to figure out which species of Root knot nematode dominate in particular regions.”

major problem in some of our vegetable crops. The project is trying to find alternative methods of control which may still rely a little bit on chemicals, but will hopefully allow growers to move away from the level of chemical use they have had in the past,” he said.

DNA testing has been found to be an improvement on the traditional manual nematode counts which are done through a microscope. These counts were extremely labour intensive and required skilful work, which in some cases could underestimate the prevalence of RKN in field samples.

In the future, if DNA testing becomes more commercially available, growers will not only receive an estimate of how

their marketable crops.”

A broad range of elements are suspected to be involved in the rate at which nematodes increase. With this in mind, a key aspect of the project is to analyse site risk factors associated with the build-up of nematodes. Soil type and temperature, environmental influences and geographic regions are all being investigated as potential risk factors associated with RKN concentration.

“Part of the reason why we are monitoring the pre-plant and pre-harvest to see how the nematodes are building up, collecting a lot of site information like soil type and environmental data and planting date and harvest dates is to



Researcher Suzie Jones examining samples in the TIAR lab

identify what the important site risk factors are and how we can improve the projection capability of the pre-plant test,” Dr Hay said.

The future

In the year to come, Dr Hay and the national team of researchers will calibrate the DNA tests in order to fine tune levels of DNA associated with the number of nematodes and its subsequent damage.

Researchers plan to produce a comprehensive package that will accumulate information on RKN and also findings from the research to give growers a reliable resource for the improved management of RKN in potato and tomato crops. Looking forward to the results of the ongoing work, Dr Hay expects the results from the project will reveal that reasonable temperature and micro climates will be important factors for the life cycle of the nematode.

THE BOTTOM LINE

- A national project to investigate the improved management of RKN in vegetable/potato crops is using DNA tests on soil, plant hosts and vegetable peels to identify species of the pest.
- Testing of ‘soft’ chemical options, concentration of nematodes from pre-planting to pre-harvest and agronomically viable break crops are being carried out in an effort to calculate the site risks associated with RKN.
- Additional work will be undertaken in an effort to improve the ability of pre-plant tests to calculate consequent crop damage.



An infected tuber displaying blistering and swelling

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Project Number: MT09067

A collaborative project develops diagnostic tests for soil-borne pathogens

A test that provides accurate predictive information on soil-borne pathogens is certain to be a useful disease management tool for potato growers, writes Karen Shaw.

As part of the Australian Potato Research Program (APRP2), a major study is examining diagnostic tests for soil-borne pathogens, including *Rhizoctonia solani*, Powdery scab *Spongospora subterranea*, Common scab *Streptomyces scabies*, and Root knot nematode *Meloidogyne fallax*.

Project leader Dr Kathy Ophel-Keller, of the South Australian Research and Development Institute (SARDI), said the technology for detecting pathogens in soils, through DNA testing, was positive for growers.

"This type of testing should help farmers make more informed decisions about disease management before planting their crop," she said.

If the tests showed the presence of specific pathogens, the farmer could opt to plant a potato cultivar that was more

“The project will now focus on working closely with growers to ascertain the usefulness of the DNA soil sampling tests and establish whether they could be integrated into the pre-planting, on-farm decision-making process.”

resistant to the pathogen, apply a pre-planting fungicide or alternatively avoid planting in the paddock due to high pathogen levels.

It is hoped DNA soil sampling tests for Powdery scab will be made available to growers within the next 12 months, with other tests added to the package also.

The on-going project, examining diagnostic tests for soil-borne pathogens, is in its third year, with the current phase focusing on improving the interpretation of the DNA tests to enable researchers to quantify soil-borne inoculum.

The study is being undertaken in Australia with collaborators at the Department of Primary Industries (DPI) Victoria and the Tasmanian Institute of Agricultural Research (TIAR), but is part of an exciting collaborative project where

researchers work closely with colleagues in the United Kingdom (funded by the Potato Council UK) and New Zealand (funded by Horticulture New Zealand).

In Australia, soil samples were taken for DNA testing from farms in South Australia, Tasmania and Victoria. Soil was collected from four specific areas of a paddock, and involved mixing together a composite of approximately 40 cores of soil to form the sample.

Dr Ophel-Keller said industry feedback had been enthusiastic, with growers keen to take part and interested in learning about the results at regular forums.

The project will now focus on working closely with growers to ascertain the usefulness of the DNA soil sampling tests and establish whether they could be integrated into the pre-planting, on-farm decision-making



process.

Dr Ophel-Keller said the DNA sampling for Powdery scab showed the level in the soil before planting was related to what developed in the crop. These initial findings showed that the test for Powdery scab would be useful for farmers.

But while these results were pleasing, similar DNA soil sampling tests for rhizoctonia needed further refining. The research found that the disease developed in crops, but had not always been detected in the soil samples.

“We will need to improve the sensitivity of our testing,” Dr Ophel-Keller said.

“This could mean increasing the sample size, but taking into account that any sampling needs to be practical and cost effective for growers.”

Despite different growing conditions, research partners in Scotland had reported similar findings with the early tests for Rhizoctonia. Ongoing collaboration will continue to improve test sensitivities.

Further analysis is needed to understand the risk posed by the pathogens in conjunction with environmental conditions. Dr Ophel-Keller said the key will be to better understand how tests were interpreted, given the effects of wet and dry years on disease development.

The research also reported that DNA soil tests for Root knot nematode and Common scab had been developed and these tests are likely to be added to the testing service, together with a test for the Black dot pathogen

Colletotrichum coccodes.

The research links with the Victorian Department of Primary Industries research on soil health and the use of non-chemical methods of controlling disease, and another project in Tasmania investigating the detection of pathogens in tubers before planting.

The results of the research into pathogen levels in tubers prior to planting would also provide valuable information,

“It is important that farmers can interpret test results and understand the information in terms of crop risk,” Dr Ophel-Keller said.

For example, if the levels displayed 50 picograms DNA of a pathogen in the soil, what will this mean? The manual would provide an interpretive tool and suggest strategies to consider before planting, particularly if the risk was high, she said. Ultimately, this information

and voluntary contributions from the Potato Council-UK and Horticulture New Zealand with matched funds from the Australian Government. The South Australian Research and Development Institute, the University of Tasmania/Tasmania Institute of Agricultural Research and the Department of Primary Industries Victoria have also provided in-kind support.

“The compilation of a grower manual is set to include details about diagnostic tests for soil-borne pathogens, keys to analysing the results and other relevant information to help improve crop productivity.”

which when combined with the soil diagnostic tests, would help determine whether there was pathogen risk from seed tuber stock, as well as the soil.

An important outcome of the combined projects will be the compilation of a grower manual that is set to include details about the diagnostic tests for soil-borne pathogens, keys to analysing the results and other relevant information to help improve crop productivity.

could be integrated into a useful decision support tool for growers.

The research is part of a multi-pronged research drive through the Australian Potato Research Program (Phase 2), funded by Horticulture Australia Limited using the National Potato Levy and voluntary contributions. This component of APRP2 has been funded by HAL using the National Potato Levy

THE BOTTOM LINE

- Accurately detecting Powdery scab DNA in soils is a positive result from an important study into diagnostic tests for soil-borne pathogens.
- Further work is needed to improve the sensitivity and accuracy of tests to detect Rhizoctonia and Root knot nematode.
- As well as Australia, the collaborative project involves pooling results from research partners in the United Kingdom and New Zealand.
- Information about the tests, together with analysis and strategies to improve risk management, will be compiled into a manual and ultimately, a decision support tool for growers and their advisors will be the final outcome of the project.



For more information please contact:

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Project number: PT09023

Dr Kathy Ophel-Keller analysing soil samples at the SARDI laboratory



A soil sample taken from paddocks to test for soil-borne pathogens



Sowing the seed of success

Excellent yields and tuber quality stem from superior seed. Nigel Crump, from the Victorian Certified Seed Potato Authority (ViCSPA), explains the best way to maximise the performance of your potato crops.

Margins in the potato industry are becoming increasingly tight, putting more pressure on getting the inputs right to achieve the best yield and quality- and potato seed has a major influence on subsequent crop performance. Nothing can be done during the growing season to compensate for yield if you are starting with poor quality seed.

The following factors contribute to the production of a complete stand of uniform plants with the potential for high yields of top quality tubers.

Do not plant a problem

☑ Seed that is certified

Certified seed conforms to guidelines of varietal purity and disease tolerances according to the national seed certification rules and regulations. Using uncertified, one-off seed, culls, oversized or seconds may lead to problems such as Potato leaf roll virus or Potato virus Y, which can be costly due to loss of yield and quality. Certification ensures that diseases are not present at levels above that which will affect yield or marketability of

the subsequent crop. For some diseases, such as bacterial wilt, complete exclusion is required to prevent spread and significant yield losses. Under the ViCSPA seed scheme, all fields are routinely soil tested for Potato cyst nematode (PCN), thereby providing assurances of PCN 'free' status.

The main reason for having a seed potato certification scheme is to manage diseases, especially viral and bacterial, and to ensure high quality seed is produced with high yield potential.

☑ Get seed from a certified grower with a good reputation

A visit to seed suppliers during the growing season, and once the crop is in storage, will help to assess the quality of the seed crop.

☑ Get seed that is free of rots and decay

Seed that is free of rots and decay will always have a higher yield potential than diseased seed stocks. Various seed treatments can be used to protect seed against specific diseases. Consult your local agriculturalist for advice and always follow the product label.

The Australian Potato Research Program is looking at new DNA diagnostic tests that can measure the amount

of pathogen on the seed, specifically Powdery scab, Common scab and Rhizoctonia. Using this new technology, researchers are studying the significance of the seed pathogen load on the levels of disease observed on the progeny crop. This will provide valuable information with which better informed disease management decisions can be made such as *'do I need a seed treatment?'*.

☑ Seed should be stored properly

Seed storage should be maintained at 2-4°C. Higher temperatures can enhance the physiological aging of the tubers, which may affect the stem number, tuber set, tuber size, and yield of the subsequent crop. Ensuring that the temperature is evenly distributed in the store is important. The temperature may be 4°C in the bottom levels of boxes but may be higher in the top boxes, thereby creating different physiological ages within a seed lot. Refrigeration damage can also occur where there is a pocket of extremely low temperature.

Carbon dioxide (CO₂) build-up in a store can adversely affect tuber quality. High levels of CO₂ can promote rots and blackheart

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What seed should I plant?

- ☑ Seed that is certified
- ☑ Seed that is free of rots and decay
- ☑ Seed from a grower with a good reputation
- ☑ Seed that has been stored properly
- ☑ Seed that is physiologically young
- ☑ Seed that is uniform in size
- ☑ Seed that has been handled to avoid bruising





Nigel Crump from VicSPA showing potato growers the process of good seed selection



“ Certified seed conforms to guidelines of varietal purity and disease tolerances according to the national seed certification rules and regulations. ”

of tubers. CO₂ in store is generated by tuber respiration, which increases with higher temperatures. CO₂ production is highest when tubers are curing (wounded tubers respire greater than those that have begun to heal) and lowest when tubers are dormant-CO₂ production increases as tubers sprout. Frequent ventilation with outside air is required to prevent CO₂ build-up in store. Evenly distributed airflow is necessary to control temperature, provide oxygen, remove CO₂ and excess moisture.

The storage area should be disinfested between seasons and clean from excessive potato debris and soil that could be harbouring disease.

‘Bad’ seed does not become ‘good’ seed in store

Seed that has defects such as rots or disease will not be better when it comes out of the store. The store is not a hospital for seed; there is no magic wand to make it better. Emphasis, therefore, should be on ensuring good quality seed for storage as it is always possible to turn ‘good’ seed to ‘bad’ through poor storage and handling.

- Seed that is physiologically young (produced without major stresses)**

Physiological age of seed can have a tremendous impact on the productivity of a potato crop. Aged seed tubers produce more stems per seed piece, which affects the number of tubers produced per set and the size of the tubers produced per set.

It is important that seed, particularly seed that is not for immediate planting, is young because it is easier to maintain in store and potentially more productive. Seed crops produced with stress, such as high temperature or drought stress, tend to be physiologically older than unstressed crops. Young seed can be aged if required, to achieve the intended result (e.g. increased stem numbers). However, old seed cannot be made ‘young’.

- Seed should be uniform in size**

Look at the uniformity and size of seed tubers. The performance of cut-seed pieces is affected by the size of the uncut mother tubers. Smaller, uniformly sized mother tubers result in:

- Uniform, blocky cut-seed pieces.
- A higher proportion of the most productive seed piece sizes (43-85g).
- Better planter efficiency, which contributes to correct plant spacing which, in turn, provides a more uniform crop

of potatoes and optimal yield. Planting small seed pieces may result in weak unproductive plants, while large pieces (greater than 85g) produce plants with excessive stems and may fall off planting cups.

Variation in seed piece sizes results in skips and/or doubles due to inconsistent feeding through the planter.

On average, seed pieces cut from large mother tubers (greater than 225g) are not as productive as pieces of the same weight cut from smaller tubers. Seed pieces cut from larger tubers have fewer eyes and may result in blind seed pieces (no eyes), causing a reduced plant stand and reduced yield.

Adjust the seed cutter to optimise the cutting of the seed lot. Sort a 5kg sample of cut seed into size categories and adjust so that most pieces are in the 43-85g range.

- Seed should be handled to avoid bruising**

Bruising reduces the vigour of the seed potato. Bruising significantly increases the risk of seed piece decay and can increase the physiological aging of seed. To minimise bruising, the internal pulp temperature of the tuber should be above 10°C before handling tubers. Drop zones on conveyers should be no more than 6 inches

(15.24cm). Use cushioning material (such as foam) to reduce the impact of potatoes in drop zones e.g. loading bins.

An electronic potato (linked to a hand held computer that allows the user to see in real-time where the impacts are occurring) can be used to assess equipment such as graders and harvesters for damage points, allowing growers to reduce excessive damage to potatoes.

THE BOTTOM LINE

- Seed potatoes are among the most expensive of inputs, but are also the most important contribution to yield and quality of a commercial potato crop. It pays to get seed quality right.
- Nothing can be done during the growing season to compensate for yield if you are starting with poor quality seed.
- Managing seed handling and storage to optimise performance is critical for maximum yield potential.

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Project Number: PT09019

2012 Convention is set to amaze

The wheels are officially in motion, moving us closer towards the next exciting AUSVEG National Convention, Trade Show and Awards for Excellence.



With new sponsorship from AUSVEG's four leading strategic partners, exhibitor places selling quickly and revitalised major events, the 2012 Convention is already shaping up to be a modern and innovative event for members of the Australian horticulture industry.

Bayer CropScience, DuPont, Elders and Syngenta have once again demonstrated their support for the biggest event in Australian horticulture,

shown, not only to AUSVEG, but to our industry, a commitment to the long-term sustainability of the horticulture sector in this country and it is important that we continue to support them in return."

DuPont Australia's Marketing Manager of Crop Protection, Steven Stillone, said the opportunities that were presented to interact with growers and better understand their needs were significant.

"At every connection point

“The long-term viability of horticulture in Australia, is underpinned by the support those in the industry and associated with the industry provide.”

reaffirming their positions as lead sponsors of the 2012 National Convention.

National Marketing Manager at AUSVEG, Simon Coburn, said the relationships which have been developed with some of the leading companies within the industry were invaluable.

"The long-term viability of horticulture in Australia is underpinned by the support that those in the industry, and associated with the industry provide," he said.

"Elders, Bayer CropScience, Syngenta and DuPont have

with growers, including the National Convention, AUSVEG has created a refreshingly professional approach," he said.

"This commitment provides an asset to our industry and DuPont is proud to be a key partner with AUSVEG."

Syngenta Territory Head-Australasia, Paul Luxton, said the partnership with AUSVEG enabled a direct connection with leading Australian vegetable growers, including through the support of the AUSVEG-Syngenta Grower of the Year Award.

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Wrest Point Hotel Casino, Hobart



Left: Delegates may take advantage of the beautiful sites at the Wrest Point Hotel Casino
Above: A suite at the Henry Jones Art Hotel in Hobart.

"In the year ahead we will be working with AUSVEG to build on the success of our Syngenta Product Plus Vegetable Workshops-award-winning spray application stewardship workshops-that have focused on giving growers the tools, knowledge and confidence to get the most out of Syngenta's products in the field," he said.

Set in the scenic location of Hobart, the National Convention will provide delegates with an opportunity to forge relationships with key members of the industry and supply chain, as well as researchers

“The National Convention will provide delegates with an opportunity to forge relationships with key members of the industry.”

and vegetable and potato growers. And, with the release of the Exhibitor Registration Brochure, trade booths at the Convention are already selling fast.

Several of the Convention's main events, including the Trade Show, will take place at Wrest Point Hotel Casino, and the location offers stylish and affordable accommodation. Located on Hobart's waterfront, also on offer is The Henry Jones Art Hotel, where delegates and families can lap-up the modern and more traditional forms of luxury in the beautiful setting of Tasmania.

Building on the success of previous years, several key events will be returning for the 2012 Convention. The Young Growers event, which in 2011 saw young vegetable producers enjoy an afternoon of paintballing and networking, will once again celebrate the sector's youngest members in an afternoon of activities sure to excite.

An important and increasingly significant element of the Convention, the Women in

Horticulture event has been restructured and invigorated, and promises to be a highlight, reaffirming the importance of women in the industry.

A new addition to the Convention for 2012 will be a Historic Pub Tour, made possible by DuPont, which will take delegates through a rich historical journey and events of Tasmania's past.

The Convention, spanning over three days, will culminate with the AUSVEG National Awards for Excellence and Gala Dinner to congratulate innovators and leaders within Australian horticulture with a magnificent ceremony and gala dinner.

Nominations for the National Awards for Excellence will open soon, with categories including Grower of the Year, Young Grower of the Year, Productivity Partner Award, Industry Recognition Award and the Women in Horticulture Award.

Now among the most coveted events in Australian horticulture, AUSVEG encourages those within the industry to start thinking about nominees for this prestigious awards night.



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The Mitolo Group

A family affair

Swiftly driving forklifts around a production floor and labouring in his father's potato and onion packing sheds as a child, today Darren Mitolo, alongside his brothers, manages one of the most successful businesses in the Australian potato industry. Caitlin Rodé spoke with Mr Mitolo for a rare glimpse inside the South Australian packing giant.

Building a business on the solid foundations of strong relationships with those growers that supply them, The Mitolo Group has been packing potatoes since the late 1970s, and growing their own since the 1990s. It becomes evident when speaking to The Mitolo Group brothers, that the history of the successful packing company has a long thread of family heritage weaved throughout it.

First established by Bruno and Angela Mitolo (Darren's parents), the brand has been forged through a hands-on approach that has established the company as the largest producer of potatoes and onions in the Southern Hemisphere.

Darren Mitolo, having succeeded his father as Managing Director, now works

alongside brothers John, as the group's Farm Director, and Frank, as the Director of Sales and Marketing.

"As children we worked on the (production) floor on Saturdays for as long as I can remember," Darren Mitolo said.

"I've learnt quite a bit (from my father and brothers), we're fortunate that we work together really well which has shown in our success."

"We are all individual and have definitely all contributed our own stamp on the business. My father Bruno is very much a proactive man, who never accepts average as standard," he said.

"He is always looking for a better way to do things and it always has to be done perfectly—this has been instilled in me

and my brothers to drive and manage what we do to ensure it's always 100 per cent."

As Managing Director, Mr Mitolo's responsibilities are spread over the entire business, including overseeing and managing production facilities, forward planning and process improvements.

"I have an excellent team to work with and I will continue to drive change, as well as encourage people to identify improvements from the floor to senior management," he said.

Mr Mitolo said his brother John lead what could be considered the tidiest and most organised farm he had ever seen, producing excellent produce regardless of the soil and water conditions.

Along with consistently

producing potatoes of a superior quality, the drive for excellence is embedded in the soils at the Mitolo Group's headquarters in Virginia, South Australia.

While brother Frank demonstrates a keen eye for sales and innovation, and was also the driver behind locating and selecting the *Carisma* LowGI potato variety that saw the Mitolo Group awarded the Innovative Marketing Award at the AUSVEG National Awards for Excellence in April, he still won't rest on the established success of the family business. Together, the Mitolo's continue to push for the next big thing that will drive sales growth.

Mr Mitolo said that it had been through methods such as these that the business had developed a great niche in the market.

"I use this approach in other



Producer Information

Producer: The Mitolo Group
Region: Virginia, South Australia
Product: Fresh potatoes and onions
Accomplishments: Won the AUSVEG Innovative Marketing Award for the Carisma potato; the largest supplier of potatoes and onions in Australia

continued over page ▶

parts of the business to keep improving, so we reach and remain at a world standard of excellence," he said.

"We look for the next step, get onto it quickly, implement it, do it to perfection and manage it. We don't take long to make things happen."

Producing 110,000 tonnes of potatoes annually, the Mitolo's manage a staggering 20,000 hectares of land across the Riverland, the Malle and the Virginia regions in South Australia.

Ensuring enough planting of seed in the region is done to meet customer demand, the large investments in land holdings allow the business to harvest potatoes all year round. With 95 per cent of the product sold in Australia, the Mitolo's supply to supermarket giant Coles and numerous independents and markets nationwide.

Challenges

Growing a new variety of potato presents difficulties - ensuring a consistent size, quality and number are produced can be a tough and tedious learning curve and the Mitolo Group's award-winning *Carisma* LowGI potato presented its own challenges.

"While it was one of the best new varieties we believe to have hit the market, for its appearance, cooking quality and also as we found out later for its GI rating, it was a very large



Darren Mitolo alongside the low GI potato

challenge to grow to the correct size and quality," Mr Mitolo said.

"I was always concerned with the volumes we were preparing to grow for the following year. My brother Frank wanted to ramp up volumes quite quickly but I was quite concerned of the financial impact if we didn't get it right."

"It did take us a good couple of years to successfully grow it and today we are getting a very strong premium percentage out of the loads from that variety."

"Today our only issue is getting enough good quality

seed to plant for the coming seasons-we can successfully grow *Carisma* in the Riverland with river water and sandy soils, and get similar results in the Malle with ground water and clay soils," he said.

The spud with Charisma

During a regular lab test to check the quality and health of a new potato which the Mitolo's had been growing, scientists discovered that the new spud – not only low in fat and creamy in texture – also possessed a low GI rating. Delivering a slower, longer lasting rise in blood glucose levels, the low GI potato could prove to be a healthy option for those watching their waistline, reducing the risk of heart disease and diabetes.

A revolution in its own right – as the world's first certified low GI potato - the *Carisma* spud has arguably changed the way consumers and the industry think about potatoes. Winning the AUSVEG Innovative Marketing Award at the National Awards for Excellence, the family's pioneering hard work continues to be recognised by the industry.

"I think that was a great acknowledgement from AUSVEG to get that award, it's added integrity to the product and Coles have taken that on board and added that onto the branding and packaging, so it is great to get recognition," Mr Mitolo said.

"The award really highlights the value and the difference it is making to the market and for

the consumers who are buying it."

"We want to continue to be market leaders in Australia and to do that I think we need to continue to have the right varieties and consistent quality and we've been able to produce that," he said.

The Future

With an appetite for success, Mr Mitolo said the business would strive to gain a higher percentage share of the market.

With consumer attitudes towards the potato changing over time, the Mitolo Group has forged a unique hold upon current and potential future markets through its pioneering methodologies. Observing a change in the markets and consumer choice, Mr Mitolo said the opportunities for advancement were limitless.

He said: "Consumers no longer see the potato as just an ordinary potato – it has multiple purposes. There has been a strong shift away from the generic potato that does everything like mash, boil and chip, and more (emphasis) on specific varieties that suit a specific purpose."

"There is a lot more happening now with new varieties, packaging, how we deliver that product to consumers – a lot of innovation in marketing. We are seeing more and more people putting potatoes back on their plates."

Darren and Frank Mitolo



Snapshot of the season

With many growers having faced a difficult growing year, a new season is upon us. We spoke with growers from each state to see how the season is tracking so far.

Thorpdale, VIC

“The weather has been very wet up to about a month ago. It has dried out now and is looking fairly reasonable. There are good planting conditions at the moment with no big issues with pests as yet. The main growing season in Victoria is just starting. In regards to rainfall, this year is looking good with all the dams filling and ground moisture levels also look good.”

Devonport, TAS

“The weather is starting to clear-up down here now and we are looking forward to the upcoming season. Previously it was a really difficult year, with so

much constant rain, it's been so frustrating trying to get a handle on what's happening. There are potatoes starting to be planted now and the weather is clearing up. Through the midlands and down south there has been lots of rain-it's been state-wide this year. We've got our fingers crossed for this coming season and hope the weather is a bit kinder to us.”

Virginia, SA

“We're just about ready to spray off crops now at this stage. There were a couple of light frosts at the start of the season, but it didn't seem to do too much damage. We've had a reasonably good season, though

it has been a bit windy in the last couple of weeks which has been knocking a few of the crops around. But Virginia looks like it's in for a reasonably good season. Pest numbers have been quite low all season, which was surprising also.”

Pemberton, WA

“The weather hasn't been too wet so there have been good plantings. We've been getting enough rain in the south west to fill dams, after last year's deeply dry winter, so it's an improvement on that. The main planting for processing and seed is yet to come but everybody is preparing, and fresh market potatoes have been planted in

the last month or so. Currently the crops that growers are getting are quite good through all growing regions.”

Atherton, QLD

“We're harvesting at the present time. It has been a tremendous season, the best one we've seen in 25 to 30 years. The crops have just been magic-we're digging now some of the best crops we've seen in a decade or more. It was a very cold winter, with little frosts, so a minimal amount of growers got caught in the frosts.”



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Ask the industry

with

Scott Mathew



Scott Mathew, Technical Services Lead from Syngenta

Changes concerning record keeping and drift management have been applied to crop protection products when undergoing registration processes in recent times. Scott Mathew answers your questions in this month's edition of Ask the industry.

Question: Why do crop protection product labels now state a specific spray droplet size category?

All registration applications for agricultural products that are subject to spray drift regulation must include a nominated spray droplet size category for product application. The registration applicant must nominate the largest droplet size category that is still consistent with efficacy for the product (See APVMA: Australian Pesticides and Veterinary Medicines Authority) OPERATING PRINCIPLES IN RELATION TO SPRAY DRIFT RISK, section 3.2, page 3).

The APVMA spray drift risk assessments are done on the basis of the nominated spray droplet size category. Where protective no-spray zones are found to be required for a product, the smaller droplet size category nominated the larger the no-spray zones will be than larger droplet size categories. Therefore, wherever possible the crop protection company applying for the registration will nominate the largest possible droplet size category that is consistent with product efficacy.

Question: How are no-spray zones determined?

A risk assessment for each pesticide is completed to determine the risk for each of the three major areas of the APVMA's responsibility—risk to human health (this threshold is set by the Department of Health and Ageing), risk to the environment (this threshold is set by the Department of Sustainability, Environment, Water, Population and Communities) and risk to Australia's international trade (this threshold is set by the APVMA).

Exposures above each threshold are deemed not acceptable and those below it can be considered negligible because large safety margins are built in to each threshold. Each pesticide has its own unique thresholds for the various risk areas, and the threshold values for a given pesticide will almost always be different for each of the three risk areas.

The next necessary step that must be done is to determine how much exposure might occur in real use situations. For spray drift, the level of potential exposure is assessed from downwind spray drift deposition data. Deposition data details how much of a pesticide is deposited from spray drift at various points downwind from the

application area. Many studies have been done to find out how spray droplets behave in the atmosphere when moving downwind, thus allowing the APVMA to set a no-spray zone.

Question: What records will we be expected to keep when spraying crop protection products?

Users of this product **MUST make an accurate written record** of the details of each spray application within 24 hours following application and **KEEP** this record for a minimum of two years. The spray application details that must be recorded are:

1. Date, with start and finish times of application.
2. Location of address and paddock/s sprayed.
3. Full name of this product.
4. Amount of product used per hectare and number of hectares applied to.
5. Crop/situation and weed/pest.
6. Wind speed and direction during application.
7. Air temperature and humidity.
8. Nozzle brand, type, spray angle, nozzle capacity and spray system pressure measured during application.
9. Name and address of person applying this product (additional record details may be required by the state or territory where this product is used).

Ask the industry

For more information or to ask a question, please contact your local Syngenta Territory Manager, the Syngenta Advice Line on 1800 067 108, visit www.syngenta.com.au or email *Potatoes Australia*: info@ausveg.com.au. Please note that your questions may be published.

Lending a hand to growers

The Department of Immigration and Citizenship (DIAC) has a number of initiatives designed to support growers in recruiting suitable workers from overseas when local aid is scarce.

Mining and construction are not the only Australian industries finding it hard to source skilled and untrained staff—vegetable and potato growers can also struggle to find workers to bring in their harvest, pack crops or maintain farm equipment.

While the government's focus is on local skills and training, the Department of Immigration and Citizenship (DIAC) has programs to assist growers in recruiting suitable workers from overseas when local help is limited.

These initiatives include visas tailored to the regional area and horticulture sector, as well as departmental officers who are out-posted to rural and regional areas and industries, to better promote these options and assist growers in understanding the options available to them.

Reaching out

DIAC's outreach officer network consists of departmental officers, out-posted to the industry and those assigned to serving the needs of the regional Australian industry. DIAC has an Industry Outreach Officer (IOO) posted with both Growcom and the National Farmers Federation. There are also Regional Outreach Officers (ROOs) in every state and territory with an additional officer posted in north Queensland.

ROOs play an outreach role, visiting regional areas to develop and consolidate partnerships with regional communities and ensuring that information on regional migration is integrated across all levels of government. They regularly undertake tours to regional areas to hold information sessions for the community, typically visiting four or five towns in nearby proximity over the course of a week.

Skilled work

Growers needing skilled workers for periods of between one day and four years, can apply to sponsor foreign workers on a



temporary basis through the temporary business (long stay) 457 visa program. To be eligible, the employer must become an approved sponsor and the position must be included on a list of approved occupations. The skilled positions might include vegetable growers, agricultural technicians or fitters (to maintain equipment) or farm managers.

Alternatively, if there is a full-time vacancy available for at least two years, they may wish to sponsor an employee as a permanent resident through the Regional Sponsored Migration Scheme (RSMS).

To be eligible, the position would require a person who has at least an Australian equivalent trade, diploma or higher qualification, is under 45, possesses functional English ability and meets any mandatory licensing, registration or professional membership requirement. Under exceptional circumstances, employees may seek exemption from skill, language or age eligibility

requirements.

During the past year, 10 fruit or nut enterprises and five vegetable growers have taken advantage of the RSMS to employ skilled workers, with a further three having sourced temporary skilled staff from Ireland, Germany and India on the temporary 457 visas.

Temporary recruits

Growers needing less skilled workers on a temporary basis have the option of recruiting working holiday makers or Pacific seasonal workers. The advantage of working holiday makers is that they can be employed on a casual basis. The disadvantage is that they seldom stay long and a lot of time and money is invested in the recruitment and training of new employees. By contrast, the Pacific Seasonal Worker Pilot Scheme (PSWPS) offers growers stability and reliability in their seasonal labour needs.

Under the scheme, growers can contract, through approved employers, workers from

Kiribati, Papua New Guinea, Tonga and Vanuatu for periods of four to six months.

Instead of ongoing labour churn, the grower has a stable and motivated crew available for the whole season as an increasingly productive workforce. The same team is also available the following season as trained, experienced workers with no required training.

While there are additional upfront costs, growers have found these are offset by the greater efficiency of workers, reduced training costs and the ability to plan the harvest, secure in the knowledge that there will be a dependable labour supply for the entire season. The two schemes are complementary rather than mutually exclusive, with many growers using Pacific seasonal labour as their primary workforce and supplementing it in peak periods with working holiday makers.

i For more information visit:
www.immi.gov.au

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Root development

Rohan Davies, Technical Agronomist at Incitec Pivot Fertilisers, discusses the interaction between root development and nutrition.

Question: How does root development impact on nutrient uptake in potatoes?

Potatoes require a steady supply of nutrients for optimum growth. Deficiencies or fluctuations of soluble nutrients, especially nitrogen, can cause poor plant growth, increase disease pressure and diminish yield and quality.

One of the reasons that the consistent supply of nutrients is so important for potato crops is that they have a shallow, inefficient root system compared with other crops, where potatoes only have one quarter of the total root length compared to what is found in wheat crops¹. Consequently, potatoes derive most of their nutrients and water from the top 30 cm of the soil.

Potato root development is best described as a three phase process²:

1. An initial rapid phase lasting three to five weeks with growth rates of approximately one to two cm a day.
2. A slower phase with growth rates of approximately 0.8 cm a day.
3. A mature phase lasting the rest of the life of the crop (0 cm a day).

The variety of potato crop which is being grown has a major influence on the duration of each of these phases.

Research indicates that a change in the rate of leaf appearance or the absence of

leaves was often followed four to nine days later by a change in growth rate or a cease in root penetration.

This indicator could allow growers and advisers to pick up when changes between root growth stages are about to occur². Root development is also greatly affected by differences in the water content and fertility of the soil.

To achieve good root development, for stronger, more productive crops, growers need to supply water and nutrients consistently through each phase of root development.

Also remember that early in the life of the crop the root volume is small, so the potential for uptake is lower, building to a maximum when the root system is fully developed.

Nutrient management in potato crops can be a very challenging exercise.

Growers need to provide a large amount of available nutrients in the top 30 cm of the soil and then keep them in this zone for several months under some potentially challenging conditions such as high irrigation rates, light soils and varieties sensitive to moisture stress.

It is not surprising then, that research has indicated the recovery of soil applied nitrogen

at only 16% to 36% under conditions of severe leaching³. Other studies have reported slightly higher numbers, but nutrient use efficiency is none-the-less inefficient^{4, 5}.

For improved crop nutrient efficiency, apply the CRAFT principle to your nutrient management plans.

C – Choice of product

Can I use an enhanced efficiency fertiliser rather than a standard product to reduce the leaching losses?

R – Rate of application

Are diagnostics being used to

determine appropriate nutrient rates and should rates change if I adopt more efficient practices?

A – Application method

Can I fertigate a liquid product in smaller doses to reduce the potential for losses?

F – Frequency of application

Can I split my applications to get a better outcome?

T – Time of application

Can I apply the product when the plant needs the nutrient?



Soil nutrition questions

Please send your soil nutrition questions to *Potatoes Australia*.
Email: info@ausveg.com.au
Phone: (03) 9822 0388

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Technical solutions

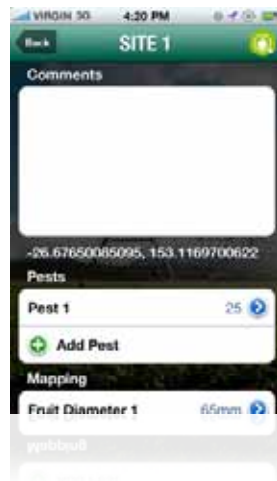
A new application for record keeping and crop analysis might just make life a little easier for growers and those in the industry.

A new mobile phone application created by Hortus called *AgPro* has an extensive list of features to ensure farm management is kept simple while still enabling superior data management, compliance and performance analysis.

The *AgPro* app for iPhone includes:

- Monitor Crop-Geo-tag pest disease and beneficial (insects) found, standardised monitoring procedures with pest categorised by crop in which they are found.
- Analysis Request-Geo-tag sample sites, and submit sample 'paperwork' on the go.
- Farm Input Record-A mobile crop diary to record date, time, product, rate, block, treatment area, weather, batch numbers and operators.
- Service Request/Record-The ability to capture services delivered by contractors or request services from contractors.
- Farm Activity Record-Growers, employees or service providers can keep track of all farm activities by date, block, crop, activity (planting, pruning, picking, spraying etc.).

Users are then able to access all of their farm data via their online account, and export it to a common format.



Users have direct access to a complete list of crop protection and crop production products available on the Australian market from their desired manufacturer or distributors. Updates are made frequently to keep data current. Products are stored by elemental composition, application method, target of pests and product category.



AgPro enables:

- Consistency in report format and result display.
- Consistency in monitoring procedures.
- Consistency in farm activity and farm input recording.
- Accuracy of recommendation content.
- Risk mitigation by specific agronomic constraints to avoid incorrect advice or application.
- Accuracy of nutrient requirement calculations.
- Compliance to legislative requirements.

AgPro app for iPhone gives users the opportunity to record every aspect of an agricultural enterprise. Once users have created and labelled specified blocks that are located at different sites around their farm, activities can be recorded by date, time and can even be 'geo-tagged' by GPS. Users are given the option to create their own 'farm input records' tab within the program and the monitor crop component of the app Geo-tags every pest identified at every site, enabling the production of a hot-spot map.

Analysis request forms can be filled out and a tracking number received, which will identify and keep you up-to-date on your samples throughout the lab process. You can request recommendations instantly by a few short steps on *AgPro* by simply ticking 'yes' in the required field.

AgPro saves users time, as information entered into the app is submitted to *AgPro Online* and analysis information can be exported from here any time, day or night, anywhere in the world. The data capture, storage and reporting capability will put an end to paging through spray diaries in the packing shed at audit time.

AgPro is available in the Apple App Store (online) from October.

Technical solutions



For more information visit
www.hortus.net.au

International collaboration: the tool for managing Powdery scab?

The Australian Potato Research Program contributed to international research and development when Australian researchers attended the third European Powdery Scab Workshop in Switzerland recently.

The workshop included outcomes of current and previous Powdery scab projects world wide- exploring issues related to understanding the biology of the pathogen *Spongospora subterranea* and its genetic diversity, the impact of the disease in the countries represented, and the development and implementation of control strategies and detection methods.

This workshop included 18 participants from 11 countries: Australia, New Zealand, Sri Lanka, Netherlands, Germany, Scotland, Israel, Latvia, South Africa, France and Switzerland. The workshop was partially funded by Bioreba.

Plant and Food Research New Zealand researcher, Professor Richard Falloon, presented the research on the comparison of root function of potato varieties when infected with *Spongospora subterranea* that vary in disease susceptibility and the New Zealand assessments of different potato cultivars for susceptibility to Powdery scab. Professor Falloon's research has shown that there are two diseases associated with Powdery scab- firstly the commonly known Powdery

scab of potatoes and secondly the lesser known infection and galling of roots. It is expected that the root infection could be a contributing factor to yield loss in potato crops.

Representing Australia

Dr Tonya Wiechel, from the Department of Primary Industries (DPI) Victoria, presented the results of two components of the current Australian research program.

The first of Dr Wiechel's presentations described an innovative method for assessing *Spongospora subterranea*, resting spore viability using RNA technology (or Ribonucleic acid- one of the essential macromolecules, alongside DNA). The pioneering technology provides a molecular tool that allows scientists to better measure the viability of *Spongospora* spores. The method will allow for a more accurate and rapid generation of outcomes for the industry.

Spongospora cannot be grown on an agar plate in the lab; it can only be grown on potatoes. Therefore, new ways of working with the pathogen will give scientists the opportunity to develop strategies for managing this difficult disease.

The second presentation by Dr Wiechel reported the exciting developments of current research being conducted in Australia, which is looking at the nutrient interactions and disease development of Powdery scab- specifically, the application of zinc and iron amendments on two cultivars, Shepody and Russet Burbank. The results were the culmination of two years of field trials in the Ballarat region, which suggests that soil zinc and iron levels have a significant effect on Powdery scab. Research is working towards establishing thresholds of soil zinc and iron levels that reduce the risk of Powdery scab in the field. This research was supported by Professor Falloon, who presented the results of glasshouse studies that demonstrated the effects of specific nutrients, including iron, zinc and nitrogen on Powdery scab root galling.

International collaboration

Dr Alison Lees, from the John Hutton Institute in Dundee (UK), presented results from a three year collaborative trial between Australia and

the United Kingdom, which investigated the infection cycle of the pathogen over the growing season and its effect on Powdery scab development at harvest. DPI Victoria researchers have been involved in this research as part of the International DNA diagnostic collaboration program. The investigations have shown that the susceptibility of potato cultivars can often vary according to countries. This information is vital to understanding how the weather (rain and temperature) can influence Powdery scab in the field.

The discussions at the workshop showed the value of collaborative research on Powdery scab, but also highlighted the difficulties involved when working with a pathogen that can only be grown on a host, which can survive in the soil for many years. Information gained from the workshop will provide essential information to guide future research projects on Powdery scab. The aim is to develop effective management strategies to reduce the harmful effects of this important disease.

This article was contributed by Dr Tonya Wiechel, DPI Victoria.

International delegates attend the third European Powdery scab workshop and [Right] Potatoes displaying Powdery scab characteristics



Genetic blueprint for potatoes uncovered

An international team of scientists have released the first draft sequence of the potato genome.

The Potato Genome Sequencing Consortium (PGSC) has developed into a global alliance of 29 research groups from 14 countries over the past five years. The team, through a collaborative process of investigation and analysis, have unravelled the sequence of the potato genome.

Containing one of the broadest genetic diversities of any cultivated plant, the potato's genome sequence could be understood as the genetic blueprint of how a potato plant grows and reproduces. As the world's most important vegetable, the potential role of the potato in world food security has become significant.

Why is this important?

Through this research, scientists anticipate that they will be able to use the genome sequence to identify genes of key interest to the potato industry—such as health qualities, yield size and pest and disease resistance—and then use molecular markers (indicators) to screen seedlings.

This process of selective breeding allows scientists to understand which part of a chromosome holds the genes for a particular trait, target crop improvements using molecular markers and in turn, reduce the cost and time (10-12 years) taken to breed new varieties.

Prominent member of the

PGSC steering committee and leader of Plant & Food Research New Zealand's effort is Dr Jeanne Jacobs, whose involvement with the project has concentrated on resequencing a number of elite cultivars used in the breeding program and from already released lines.

"The genetic blueprint for the potato gives us the best handle to understand where the genes are, what the genes look like, what the on/off switches are like and what the variation is in different types of potatoes—there are a lot of traits that you can't see just by looking at the spud, like disease resistances, pest resistances and nutritional value," Dr Jacobs said.

Scientists from Plant & Food Research New Zealand contributed genetic sequencing data to the project and were instrumental in constructing the gene map that forms part of the whole genome sequence.

"We've made a baseline, which is a reference genome, and have now started to resequence cultivation breeding lines," she said.

"We can layer (these) over the top of the reference genome that we have, and look for differences in what makes a very good processing potato, for example."

What is the importance of breeding new varieties?

Sustainability. By 2020 it has been estimated that some two billion people worldwide will depend on the potato for

food and income. Developing nutritious, high yielding and agronomically sound cultivars will become paramount to the stability of the international community.

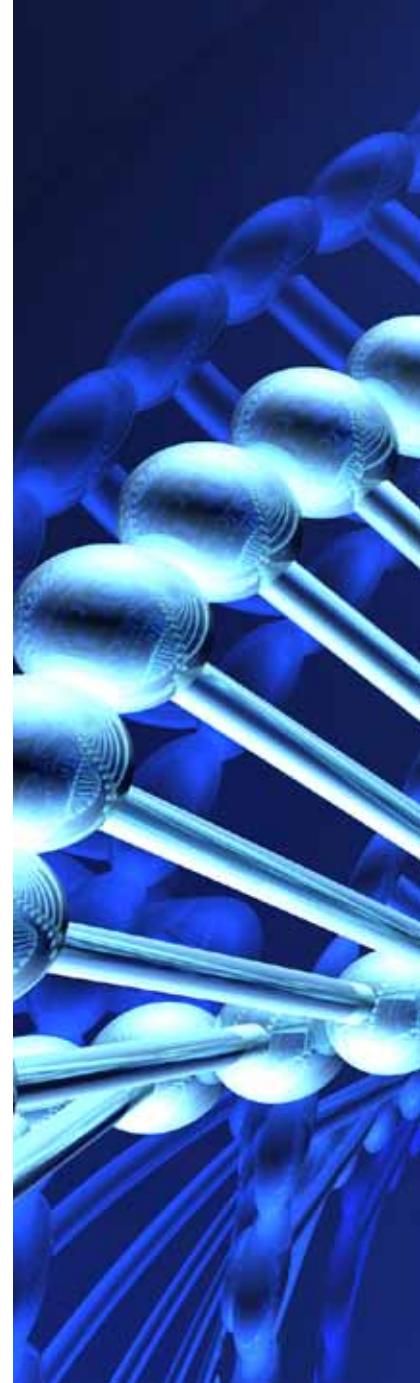
It is expected that one of the advantages of understanding the potato genome sequence will be a significant improvement in the ability to characterise and select genes concerned with disease resistance.


"There are general cultivars that have not been bred to withstand all the pests and diseases that are a major problem these days and we don't like to put too much insecticide and pesticides on our crops...we need to try and stay ahead of the game," Dr Jacobs said.

"It now gives us handles to make a more efficient breeding program...when we want to try and breed in the new traits, we've got to be able to say here



Dr Jeanne Jacobs showcasing new cultivars. Photographs courtesy of Plant & Food Research New Zealand.





“ One of the advantages of understanding the potato genome sequence will be a significant improvement in the ability to characterise and select genes concerned with disease resistance. ”

are the genes that we really want when we make these crops, but we're going to cross the rest out—we don't want to have the deleterious ones that come along with it.”

Dr Jacobs said the potato genome sequencing research could also possibly assist in the future of growing potatoes with minimum amounts of input, including minimal use of water and extra fertilisers—which could be beneficial for those countries where water has become more expensive.

“You want to be able to grow potatoes 50 years down the track on the same piece of land, to not deplete the soil too much and to be able to grow these things well into the future,” Dr Jacobs said.

“And, of course, the other thing is yields—yields are one of those intangible things that we always want more potatoes for

our buck, and with a growing world population also becoming reliant on potatoes, there is still some room for improvement,” she said.

An international effort

Contributing research from the United Kingdom component of the consortium, Dr Glenn Bryan, from the Scottish Crop Research Institute (SCRI), said the genome sequence was a major step forward in the understanding of potato biology, with the research greatly accelerating the breeding process of new varieties.

The Scottish Crop Research Institute and the University of Dundee, in north east Scotland, are the only members of the United Kingdom international consortium.

Dr David Martin from the Division of Biology Chemistry and Drug discovery at the



[L to R] - Researchers working on the potato genome Dr Susan Thomson, Dr Mark Fiers and Dr Jeanne Jacobs from Plant & Food Research NZ.

University of Dundee said: “Piecing together the exact DNA sequence of the genome has been a technically demanding task requiring the expertise of all our collaborators worldwide.”

“We can see for the first time the secrets of the potato genome, and now begins the challenge of analysing them over the coming months and years.”



Q&A Young grower profile

Kain Richardson



Name: Kain Richardson

Age: 30

Location of farm: Newlyn, VIC

Potatoes farmed: We grow potatoes for processing.

Role in company: My role in the company is the management of day-to-day operations of the business.

How did you get into the industry?

I finished Year 12 and did a farm apprenticeship for three years, which was mainly on-farm training and I've been involved with it ever since. It's a family farm so that's how I got involved.

Do you plan to continue farming into the future?

Yes, as long as the industry enables it.

What are some things you

think could help ease the stress on Australian growers?

The cost of regulation to business. Things such as water licences that used to be renewed every 15 years are now renewed every five. Employing staff and the added expense in penalty rates. These are all costs that add up, and make us less competitive in world markets. Companies are always going to expand where the cost of production is lower.

How do you think younger people could be encouraged back into farming?

You have got to have a keen interest and a passion for farming/growing and also have good training on offer to entice young people into the profession. Unless you have got a keen passion for farming (growing) you are probably not going to want to step into it to start with.

What is the best thing about your job?

Everything. One of my favourite things would definitely be the results you get after all of the

work you put in to it. And the environment that we work in; being outdoors all the time, I absolutely love it.

If you weren't farming, what would you be doing?

I'd probably be a mechanic or take up a trade.

What do you like about Potatoes Australia the most?

I like the whole magazine. It gives an insight into different parts of the industry; grower profiles, disease management and reform information. Everything in it is handy-you always get something out of it that's for sure.

Pests & Diseases

IPM in potatoes

In this edition of *Potatoes Australia*, the Pests & Diseases profile takes a closer look at Integrated Pest Management (IPM) options.

Since the 1990s, Australian potato growers have been on the international forefront of using Integrated Pest Management (IPM) in their pest management programs. There are three components to IPM which incorporate tools available for farmers to control pests:

- Chemical control (insecticide spray) is a support tool in an IPM program rather than a stand-alone control method.
- Cultural controls (such as using certified seed, weed control, irrigation methods and soil management) are extremely important in potato IPM.
- Biological controls (the beneficial insects and mites that prey on or parasitise pest insects) are the basis of IPM.

However, as the biological controls are naturally occurring and do not need to be brought in, there is sometimes a lack of awareness of the massive contribution these bio-control agents give to potato production. Similarly, soil preparation, irrigation and seed quality are required for other reasons, and so their role in the control of pests within an IPM strategy can sometimes be forgotten.

This leaves chemical control. Some people may think that the control of pests is due solely to the pesticides applied, but in fact the level of control achieved (or lost) depends on the integration of pesticides and biological and cultural controls. And so it is extremely

important that the application of any pesticide (fungicide or insecticide) does not disrupt biological control in particular, and does not attempt to replace cultural controls (good practice).

The role of insecticides within IPM is to be a support tool as required, therefore broad-spectrum insecticides as sprays during the life of the crop are not appropriate. The newer, selective insecticides such as Success™, Coragen® and Belt® have a much better role to play in IPM. Each of these products can negatively impact upon populations of some beneficial species, but if you know which ones then they can be used strategically—a much better way to use insecticides.

In practice, what does a

potato grower have to do to use IPM? Just think of the three options that are available: biological, cultural and chemical.

1. Allow the biological control agents to do their work;
2. Choose pesticides that do not kill key beneficial species (i.e. avoid using broad-spectrum insecticides); and
3. Use the best available cultural controls for the range of pests and diseases that attack your potatoes.

Article prepared by Dr Paul Horne and Jessica Page of IPM Technologies Pty Ltd, 2011.
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and tuber initiation

- Comprehensive nutrient foliar with kelp
- Improve plant stress management



Calendar of events

23-24 November 2011

British Potato 2011

Where: Harrogate, United Kingdom

What: The event dedicated to the British Potato Industry is tailored to accommodate all parties involved in the growing, handling, processing and retailing of potato crops. Delegates will have the opportunity to discuss growing, packing and processing, view scientific advances and research & development work being done by the Potato Council, universities, research centres and commercial companies, and reflect on business matters, including overall consumer trends and marketing.

Further information: www.bp2011.net

29 November-1 December 2011

Food Ingredients Europe and Natural Ingredients 2011

Where: Paris, France

What: Food Ingredients Europe is a biennial event which brings together the world's foremost food and beverage suppliers, R&D, production and marketing professionals and presents the most diverse range of new and innovative ingredients and services. The previous event in 2009 in Frankfurt, Germany, saw over 20,800 local and international attendees.

Further information:

www.fieurope.ingredientsnetwork.com

30 November-2 December 2011

AgriPro Asia

Where: Hong Kong

What: An industry event dedicated to promoting the international trading activities of agricultural products. Suppliers, manufacturers and traders will have the opportunity to showcase their products, conduct valuable business-to-business networking and engage potential business partners.

Further information: www.verticalexpo.com

4-6 January 2012

The Potato Expo

Where: Orlando, Florida

What: The largest conference and tradeshow for the North American Potato Industry, The Potato Expo offers interesting and informative programming, which will cover important issues affecting the potato industry. The event will provide numerous networking opportunities with key decision makers and showcase the latest products and services for the potato industry.

Further information: www.potato-expo.com

10-12 May 2012

AUSVEG National Convention, Trade Show and Awards for Excellence 2012

Where: Hobart, Australia

What: Now the biggest event of its kind in the Australian horticulture industry, the AUSVEG National Convention showcases speaker sessions, exhilarating entertainment and the impressive trade show. Set at the Wrest Point Hotel-Casino in Hobart, the event will provide delegates with an opportunity to forge relationships with key members of the industry, supply chain, researchers and vegetable and potato growers.

Further information: www.ausveg.com.au or email convention@ausveg.com.au

27-30 May 2012

World Potato Congress

Where: Edinburgh, Scotland

What: Hosted by the Potato Council, the event will span from May 27th to May 30th, bringing together over six hundred delegates from international locations including growers, producers, traders, processors and manufacturers. The Congress will enable a global exchange of information between the world's potato specialists on all aspects relating to the potato industry. Attendees will have the opportunity to take part in a number of tours to see developments in the potato industry in Scotland and visit local growing and production facilities.

Further information: www.potatocongress.org

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